



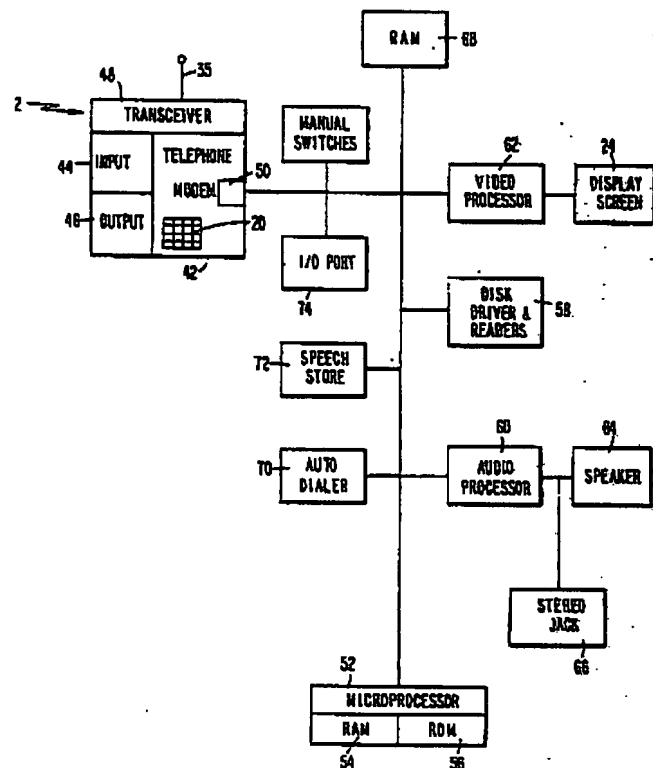
## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 5 : <b>H04M 11/00</b>		A1	(11) International Publication Number: <b>WO 93/16550</b>
			(43) International Publication Date: 19 August 1993 (19.08.93)
(21) International Application Number: PCT/US93/00853		(74) Agent: LeBLANC, Robert, E.; Lowe, Price, LeBlanc & Becker, 99 Canal Center Plaza, Suite 300, Alexandria, VA 22314 (US).	
(22) International Filing Date: 2 February 1993 (02.02.93)			
(30) Priority data: 834,051 11 February 1992 (11.02.92) US		(81) Designated States: AT, AU, BB, BG, BR, CA, CH, CZ, DE, DK, ES, FI, GB, HU, JP, KP, KR, LK, LU, MG, MN, MW, NL, NO, NZ, PL, PT, RO, RU, SD, SE, SK, UA, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, SN, TD, TG).	
(71) Applicant: BELL ATLANTIC NETWORK SERVICES, INC. [US/US]; 1310 North Court House Road, Arlington, VA 22201 (US).		Published With international search report.	
(72) Inventors: CLAGETT, Donald, J. ; 16616 Winterwoods Court, Rockville, MD 20853 (US). CLARK, Kenneth, W. ; 7401 2nd Avenue, Sykesville, MD 21784 (US). COURTEMANCHE, Ann, Marie, E. ; 4201 Lee Highway, #209, Arlington, VA 22207 (US). MORAN, Walter, D. ; 4501 North 18th Street, Arlington, VA 22207 (US).			

## (54) Title: SELF-POWERED PORTABLE TELEPHONE WITH CDI DISK STORAGE MEDIUM

## (57) Abstract

Self-powered portable telephone stations (10) are provided which accepts user inserted storage media (30) such as cards or disks capable of storing a large variety of data or information. The preferred storage medium is a CDI disk. The stations include a radio transceiver (48) for connecting to a telephone network. The station is provided with a display screen (24) and control switches (28) and interaction is provided between the database in the user disk and distributed databases in the communications network. The system is capable of providing basic directory information and auto-dialing (70) and also comprehends more versatile and sophisticated services based upon the complete portability of the station and the very large data storage capacity of a CDI disk used in conjunction with the distributed data storage capacity associated with the telephone network.



AN 4

**FOR THE PURPOSES OF INFORMATION ONLY**

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	FR	France	MR	Mauritania
AU	Australia	GA	Gabon	MW	Malawi
BB	Barbados	GB	United Kingdom	NL	Netherlands
BE	Belgium	GN	Guinea	NO	Norway
BF	Burkina Faso	GR	Greece	NZ	New Zealand
BG	Bulgaria	HU	Hungary	PL	Poland
BJ	Benin	IE	Ireland	PT	Portugal
BR	Brazil	IT	Italy	RO	Romania
CA	Canada	JP	Japan	RU	Russian Federation
CF	Central African Republic	KP	Democratic People's Republic of Korea	SD	Sudan
CG	Congo	KR	Republic of Korea	SE	Sweden
CH	Switzerland	KZ	Kazakhstan	SK	Slovak Republic
CI	Côte d'Ivoire	LI	Liechtenstein	SN	Senegal
CM	Cameroon	LK	Sri Lanka	SU	Soviet Union
CS	Czechoslovakia	LU	Luxembourg	TD	Chad
CZ	Czech Republic	MC	Monaco	TG	Togo
DE	Germany	MG	Madagascar	UA	Ukraine
DK	Denmark	ML	Mali	US	United States of America
ES	Spain	MN	Mongolia	VN	Viet Nam
FI	Finland				

"SELF-POWERED PORTABLE TELEPHONE WITH CDI DISK STORAGE MEDIUM"

Technical Field

This invention relates to telecommunications systems and services and more particularly to an improved telephone station incorporating apparatus providing enhanced access to telecommunications networks.

Background of the Invention

Telecommunications systems and services today are in an era of rapid evolution aimed at providing alternatives to the wired public switched telephone network (PSTN). Most of the proposed alternatives to the conventional subscriber PSTN provide an added degree of mobility to telephone usage. Some of the presently existing options include:

1. So-called cordless telephones for use in and around the residence or work place for both call origination and call reception.

2. Cellular telephones which were initially provided in automobiles over large areas but were generally limited to low traffic per unit area. Cellular

telephones provide two-way but predominantly subscriber originated communications.

3. Paging is a widely available service which serves an area as large as necessary. Generally speaking the communication is one-way to the subscriber and customarily signals the subscriber to go to a telephone.

In addition to the foregoing existing services the objectives of enhanced mobility and multi-service terminals are now being addressed by two proposed new services, namely, telepoint and Personal Communications Networks (PCNs).

Telepoint in essence comprises an extension of the cordless telephone. The first generation of such service provides primarily call initiation and not complete two-way service. The telepoint subscriber is provided with a cordless handset which may be used within a predetermined range (presently about 100 yards) from a phone point which may constitute a home, office or public pay telephone. Phone point base stations can be situated in both indoor and outdoor public locations such as airports, railway stations, shopping centers, highways, etc., to allow authorized users to make telephone calls.

In use of such telepoint service the caller turns his/her handset on anywhere within the predetermined distance from a base station and presses the key sequence to access the base station. The handset then establishes a radio link with the base station. The handset also

transmits to the base station stored authorization details or data. The base station in turn checks the authorization data and may prompt the user to manually enter a Personal Identification Number (PIN), if required. The base station checks that the PIN algorithmically matches the authorization data and that the authorization data is not on a locally held reject list. The caller is then prompted to dial the number he/she requires. The base station analyzes the dialed digits and decides if the call requires more detailed central authentication. If the caller is not authorized, as where the handset was stolen, the handset may be disabled by the base station so that it cannot be used again. If the call is authorized, the base station sets up the call via the PSTN.

The base station notes the time and date when the called subscriber answers and monitors the duration of the call. When the calling subscriber terminates the call the base station stores the call data such as the authorization details, date and time of call, call duration and dialed digits, etc., for later transmission to the central system for billing. A regional controller responsible to phone point management maintains a continuous surveillance on the system via the PSTN. Calls can either be billed directly to customers from the administration center or forwarded to the relevant network operator or program for billing.

**SUBSTITUTE SHEET**

A second proposed service, which is generally referred to as a Personal Communications Network (PCN), is a personal, totally portable, wireless communications network. PCN features a light weight, wallet sized cordless telephone connected to other telephones on and off the wireless network via a honeycomb of radio based microcells supported by an intelligent network, together with state of the art modulation techniques. PCN is intended to offer advanced voice and data communications totally independent of, or in tandem with, the PSTN. This new service is proposed to operate within a portion of the spectrum in the 1.7 to 2.3 GHz range. PCN is a generation beyond mobile phones as known in the cellular service today. Because it will use microcells which will greatly expand frequency use and reuse, PCN will be available to greater masses of users. Because of its intelligent network it is proposed that personalized "smart cards" be provided to offer advanced service features such as highly selective call ringing and rejection, virtual private networks and ISDN features.

Such PCN service is not presently available in the United States but has been provided on a limited basis in the United Kingdom. However, PCN's spectrum demands and ubiquity require a large allocation of dedicated spectrum which is likely to entail delay in wide scale introduction of such a service in the United States.

**SUBSTITUTE SHEET**

In addition to the foregoing recent years have seen telephone service widely expanded to embrace a great many new applications and new forms of telephone stations connected to the PSTN. Certain of these new forms of telephone stations are sometimes referred to as intelligent phones. Telephone sets are presently available which provide the capability of automatic redialing of either the last number dialed or of a previously saved number. Various speed dialing features have been provided. The simpler forms utilize a chart showing the correspondence between names or titles of destination stations and the various speed dialing numbers which may comprise one or more digits.

More sophisticated versions of devices facilitating dialing may provide a dialing apparatus which permits the operator to search through destination names or titles via a display associated with prestored numbers. One such device is illustrated in U.S. Patent No. 4,908,853. In other arrangements communications terminals, such as desk top terminals, personal terminals and personal work stations, are arranged to allow the user to create a personal telephone directory, which can be displayed on the terminal screen. A device of this type is described in U.S. Patent No. 4,899,377.

Various types of telephone related interactive purchasing or other marketing type systems have been proposed. For example, U.S. Patent No. 4,071,697

describes a complex interactive purchasing system which enables a user's television to become a shopping terminal. The TV antenna receives broadcast signals from a transmitter including a centralized computer system and feeds the signals through a controller which continuously modulates and decodes the RF information. From the decoded information, the controller recognizes the address of discrete blocks of information. The viewer selects the block of information which he desires by means of a keyboard provided on the controller. The viewer may also indicate that he/she desires to purchase a particular item displayed on the TV screen by depressing the appropriate keys on the keyboard. The controller then generates DTMF dialing tones corresponding to the telephone number of the store from which the item may be purchased and feeds the signals to an associated acoustic coupler on which the handset of the user's telephone rests. In this manner the telephone number of the appropriate store is automatically dialed.

As another example of enhanced service telephone, U.S. Patent No. 4,456,925 proposes to integrate a telephone with a standard television receiver so that repertoire of stored telephone numbers may be recalled for display on the television receiver screen before being automatically dialed. It has also been proposed to circulate via mass media such as books, magazines or



newspapers, calling cards or the like which include a single microchip pre-programmed to store and recall a specific predetermined telephone number and to produce a corresponding train of DTMF dialing tone signals. U.S. Patent No. 4,941,172 describes a proposed system of this type.

One form of a so-called general purpose electronic telephone station is shown in U.S. Patent No. 4,291,198. That device or system is microprocessor based and includes a handset, a video output display screen and a full alphanumeric key set. The system utilizes a conventional telephone handset and a cathode ray tube display and thus is relatively large. Still another microprocessor based telephone-like device which includes the functions of an ordinary telephone is described in U.S. Patent No. 4,503,288. The system described in that patent provides voice and data communications and includes a provision for direct connection and acoustic coupling to a telephone line for ordinary voice communications or for data communications through a modem. A full alphanumeric keyboard coupled with a significant buffer memory and a one line display in the terminal provides for buffering of incoming and outgoing data as well as the display thereof.

Other proposals have been made for the provision of console type telephone stations for providing a variety of data and mechanisms for utilizing such data. One such

proposal is described in U.S. Patent No. 4,720,849. That patent describes several embodiments of a console type display apparatus which may be installed in or in front of a railroad station to display hotel information. The device is suitable for counter or wall mounting or may be provided in kiosk form. A display screen is provided for displaying information in response to actuation of an operating switch. A card or coin insert slot is provided along with a search switch. The unit is provided with a library of various video disks which may be selected for display. The operation of the device is as follows:

Video disks containing information regarding predetermined hotels are provided in the video disk library in a display/memory device. When power is provided the information is successively or seriatim displayed on the screen initially in outline form without details. A desired display of information may be selected by operating numeral keys to select, for example, hotel information, motion picture theater information, or the like. After the type of information is selected, a search switch is operated to cause display information to be fast fed over the screen at intervals of 5 seconds, for example. When information on a desired hotel is displayed the search key is released. As a result detailed information regarding that hotel is successively displayed. At the same time a voice commercial is produced from a speaker. In this case the

last frame is displayed for a longer period such as 10 seconds.

When the user is satisfied with the detailed information, he/she unhooks the handset, inserts a magnetic card or a coin into the card insert section, and depresses the call switch. As a result the directory number corresponding to the displayed information is automatically searched from a dial number memory bank in the device and a telephone circuit to the telephone set in the hotel is established. Before the user's speech starts, the destination hotel is informed of the location of the information display apparatus as the source of call in synthesized voice, for instance, "New York", which is reproduced from data stored in a voice synthesis unit in the device.

If the user does not desire to make a reservation he/she may wait for ten seconds or depress the search switch again. As a result the display of further outline hotel information is resumed.

The procedure for operating the device is described in an announcement to the user from the speaker. This is in addition to the procedure for operation described in an information plate attached to the unit. For example, when the logic control determines that the search is for a hotel, it may play a prompt such as "Keep search button depressed until your favorite hotel is displayed."

While the foregoing devices propose a variety of capabilities and services they for the most part involve large equipment or assemblages of equipment which represent considerable investment.

5      Disclosure of the Invention

According to the invention there are provided completely portable unwired mobile stations which serve as telephone stations or instruments as well as other purposes. The new stations are adapted to include or  
10      accept user supplied cards or disks capable of storing a virtually infinite variety of data or information for discrete use and/or for interacting with the telephone instrument. In a preferred form the user supplied or specified data comprises a CD disk or more particularly  
15      a CDI disk. The multi-function station may be constructed for completely wireless communication from unit to unit or may be arranged for wireless connection to the Public Telephone Network (PTN). The new station is provided with a display screen and control switches.  
20      Interaction is provided between the database in the user disk and distributed databases in the telecommunications network. As one objective the system is capable of providing basic directory information and auto-dialing. However the invention comprehends more versatile and  
25      sophisticated services based upon the complete

portability of the station and the massive data storage capacity of a CDI disk used in conjunction with a microprocessor and memory in the new station. A standard compact disk is capable of storing 650 megabytes of information 300,000 pages of text, or 1000 floppy disks' storage, or 7000 photographic quality pictures or 72 minutes partial screen 15 frames/second motion video or hours of audio. Because each user may supply one or more disks suited to his/her personal or business interests, it will be appreciated that the potential variety of usages of the system of the invention is large.

It is accordingly an object of the present invention to provide an improved portable wireless telephone station which accepts and interacts with user supplied databases to serve a variety of purposes.

It is another object of the invention to provide such a device in a compact form capable of economic implementation.

It is still another object of the invention to provide a new and improved portable and wireless telephone station system which places at the disposal of a user not only the distributed database capacity of the telephone network but also data unique to the particular user.

It is another object of the invention to provide an improved telephone station and methodology of the

foregoing type which is based on existing technology standards.

These and further objects and advantages of the invention will become more apparent upon reference to the following specification, claims and drawings.

#### Brief Description of Drawings

Fig. 1 shows an illustration of an improved multi-purpose telephone station constructed according to a preferred embodiment of the invention;

Fig. 2 shows an illustration of a second embodiment of an improved telephone station constructed according to the invention;

Fig. 3 is a simplified block diagram of the telephone station illustrated in Fig. 1;

Fig 4 is a block diagram showing the relationship of the telephone station of Fig. 1 to vendor and corporate databases;

Fig. 5 is a block diagram of the preferred CDI system utilized in the multi-purpose telephone station constructed according to the invention;

Fig. 6 shows the CDI system of Fig. 4 broken down into a CDI Base Case decoder and CDI Base Case peripherals; and

Fig. 7 is a flow diagram illustrating one example of usage of the system of the invention.

Best Mode for Carrying out the Invention

Referring to Fig. 1 there is shown a CDI-Phone device 10 which is in so-called clam shell form having a base 12 and hinged cover 14. The cover is hinged to the base at 16 and is provided with a suitable detent spring 18 for releasably locking the cover in a position vertical to the base as illustrated.

The unit is provided with a DTMF keyboard 20 and speaker 22. An LCD display screen 24 is mounted within the cover and cursor positioning switches and control switches are provided at 26 and 28. A slot for reception of a storage disk is provided at 30 in case 12 and a disk drive and reader are contained within the case. A suitable antenna is provided at 35 and may be of the telescoping type to permit retraction for carrying purposes. A jack is provided in the side of the case for receiving a transmit/receive plug 32 connecting to a conventional handset, boom mike and ear piece, or bone conduction transmit/receive headset such as indicated at 34. Transmit/receive devices of this type are described by way of example in U.S. Patents Nos. 4,588,867 and 4,930,156.

Referring to Fig. 2 there is shown an alternate construction for the CDI/phone described with respect to Fig. 1. In that figure there is shown a clam shell type construction similar to that described in Fig. 1 wherein the same reference numerals are applied to the various

components. According to this embodiment of the invention the handset is provided as a component portion of the clam shell by providing an earpiece at 36 and microphone or mouthpiece at 38. A jack 40 is provided as in the embodiment of Fig. 1 for alternate use of the type transmit/receive devices described with respect to that figure.

The components of the CDI phones illustrated in Figs. 1 and 2 are illustrated in simplified block diagram form in Fig. 3. Referring to that figure the plain old telephone components of the CDI phone device are shown at 42 with an input (microphone) indicated at 44 and an output (speaker) at 46. The DTMF keyboard appears at 20. A radio transceiver is shown at 48 connected to the antenna 35.

The CDI portion of the unit is connected to the plain old telephone portion via a modem 50 and comprises a microprocessor 52 having RAM and ROM memories at 54 and 56. A disk drive and reader is shown at 58 connected to the microprocessor and to an audio processor 60 and video processor 62. The audio processor inputs a speaker 64 and stereo jack 66. The video processor inputs the display screen 24. A supplemental RAM storage is indicated at 68. The unit is provided with an auto-dialer 70, speech store 72 and I/O port 74.

The CDI portion of the unit is a real-time system capable of playing CDI disks and decoding the various



types of data (i.e., audio, video, text, program related data) from the disk. CDI is the name given to both the Compact Disk Interactive media (the disk) and the Compact Disk Interactive media system (the hardware) that conform to the specifications available in the Compact Disk Interactive Full Functional Specification ("Green Book"), N. V. Philips and Sony Corporation, Sept. 1990. That specification also complies with the specifications defined in the CD-Digital Audio (CD-DA) Specification ("Red Book"), N. V. Philips and Sony Corporation. See also the OS-9 Technical Manual portion of the Green Book, Microware Systems Corporation, 1990. Such specifications are herewith incorporated by reference.

A CDI system is made up of hardware and system software which conforms to the CDI Base Case specification detailed in Chapter VIII of the above cited Green Book. The Base Case model is illustrated in Fig. 4. Referring to that figure, the CD-Control Unit 76, in response to commands from the operating system (i.e., CD-FM of CD-RTOS 78), accesses the disk via the CD-DA Controller/Decoder 80. When CD-DA tracks are being accessed the data is transferred directly to the Audio Processing Unit 82 whose function is to control the attenuation, set the panning and output to analog audio left/right signals where stereo signals are being generated.

If a CDI track is being accessed the CD-Control Unit 76, in response to commands from the operating system (i.e., CD-FM 78), selects sectors from the data stream and transfers the CDI sectors to the ADPCM decoder 84 (for direct audio playback) or, via the system bus, to memory (for audio, video or program related data). Audio data is usually routed continuously to the ADPCM decoder which decodes it in real-time to produce analog audio, which is output via the Audio Processing Unit 82. Video and program related data as well as audio data to be stored in a soundmap is routed, by means of the DMA controller 86 MPU 88, to RAM 90.

The RAM is organized as two separate banks each of a minimum size of 512Kb, which is shared between MPU 88 and video decoder 92 by an Access Controller 94. Although the amount of memory used by CD-RTOS 78 and the system modules will vary depending upon the number of processes active and the number of open paths, it is guaranteed at start-up of the application to be less than 64k, split evenly between the two banks. All other RAM may be used for either audio, video or program related data.

Video data consists of both pixel data and video control data. The display of pixel data from RAM is by means of a two path display controller. Video data is accessed independently in the two banks of RAM, and the

two display paths are combined to produce a single analog RGB video output from the video decoder 92.

The operating system (CD-RTOS) is contained in ROM. Moreover, there is a small area of non-volatile RAM which is available both to the operating system and application programs. The user interface is primarily by means of an X-Y pointing device. The telephone DTMF key board is supported, but does not form a part of the Base Case system.

The CDI Base Case is illustrated in Fig. 5 broken down into a CDI Base Case decoder and CDI Base Case peripherals. The CDI Base Case decoder is the nucleus of the system and comprises the microprocessor 88, audio processor 82, video processor 62, memory 90 and CDI control unit 76. CDI peripherals comprise input and output devices used in connection with the CDI Base Case decoder. These may include FDD 98, Modem 50, Printer 100, Hard Disk 102, Double Resolution and High Resolution Displays 104, 106 and other devices 108.

The cursor switch 26 allows the user to control the position of the screen graphics cursor. Depressing these keys does not automatically cause the desired action, this is brought about by the application program and actuation of the action keys on the keyboard 20 or by switches 28.

Referring to Fig. 6 the relationship of the CDI phone with the telephone network is illustrated according

to one embodiment of the invention. A CDI phone 110, which may be of the cellular type, is connected to the public telephone network illustrated as a cloud 112. This connection may be via a cellular base station 114.

5 Similar connections to the network may be made by other cellular type CDI phones such as the unit illustrated at 116 connected to cellular base station 118 and thence to the public network. At the same time connection to the network may be made by a personal PCN CDI phone 120 via  
10 a PCN base station 122. Also connected to the public switched telephone network 112 are various vendors 124 and 126 and various corporate headquarters illustrated at 128. The various vendors and corporate headquarters are provided with databases or stores 130, 132 and 134.

15 The massive data storage capacity of available CDI disks opens almost unlimited possibilities of applications in the telecommunications environment of the invention. The CDI data storage capacity includes long playing audio (ADPCM), digital graphics (DYUV, CLUT, RGB,  
20 RL), text, computer programs, and 16 bit digital audio. A single CDI disk can store over one million words, or more than an entire 25 volume encyclopedia. Advanced data compression techniques permit sound tracks of a maximum of 16 hours and the 16 bit microprocessor and  
25 megabyte of computer memory permit the CDI unit to bring out the full potential of information stored on the disk. Various graphics display modes and special effects can be

applied to match the program material. Normal resolution motion video is supported at either 25 or 30 frames/second.

5 With this capability it is possible to provide on a selective personalized basis enormous sales information not only in still catalog format but also including animated or motion picture demonstrations of products in action. Price and shipping information may be accessed by the user from the disk. At this stage a connection  
10 may be made to the vendor, inventory status and shipping dates may be determined along with any price changes and orders may be placed.

15 In another example of the extreme versatility of the invention the disk data may be relied upon for selection of a restaurant, and additional information regarding the specialties of the day may be obtained either in automated or human operator assisted fashion by connection to the involved restaurant via the telecommunications network. Reservations may be made and  
20 directions to the restaurant obtained. Map data may be displayed either on the basis of data in the user's disk or data obtained from the distributed data on the telecommunications network including data provided by cooperating restaurants. In addition to the foregoing,  
25 map and route data may be obtained from both the disk database and the databases connected to the network. In still further addition, map data may be obtained from

radio beacon signals of the type described in Assignee's  
copending Application Serial No. 07/667,990 now allowed.  
This data may be utilized to provide a map with route  
markings on the display screen which is carried along on  
the trip to the restaurant.

According to this feature of the invention the user  
of the device may display a map from data in the user's  
disk. On contacting a travel agency or a restaurant or  
the like the person at the agency may call up on his/her  
screen the same map and then proceed to input route  
markings using a mouse or similar device. Such markings  
may be simultaneously or sequentially inputted to the  
user's screen to provide the user with a marked map which  
may be stored for recall when traveling the route. The  
auxiliary buffer memory 68 may be used for this purpose  
and cleared after the route markings have served their  
purpose. Such an auxiliary memory may be essential to  
this purpose. Alternatively to the foregoing or in  
conjunction therewith the portable telephone station may  
be connected to a printer via the I/O port 74 in Fig. 3  
in order to obtain a printed permanent record.

One example of the usage of the new system and  
apparatus is the use of the system in making a restaurant  
reservation. In the case where the disk of the user  
contains a yellow page directory of the restaurants in  
the city involved and also contains menu data for the  
principal restaurants the system operates as follows:

The user inserts the appropriate CDI disk into the slot of the telephone station and utilizes the keyboard on the data unit to access the yellow page listings for the type restaurants desired. The advertising information  
5 contained in the yellow page database is then reviewed on the screen with the user scrolling backwards and forwards to select a restaurant.

The selection process may involve going beyond the yellow page directory advertising information to access  
10 menus which are stored in the disk of the user. Such disks may be supplied by the vending establishments desiring to participate in the new methodology and use such disks as a new and effective type of advertising. Following a review of selected restaurants and menus the  
15 user depresses the auto-dial switch in switch group 28 whereupon the data management unit or CDI unit seeks out the directory number in the advertisement database and provides the signal to initiate the auto-dialing routine. The user is then connected to the participating  
20 restaurant.

Two types of participation by restaurants are possible. In the first instance a simple telephone connection is made to the reservation desk of the restaurant. The caller may then ascertain the specials  
25 of the day and prices. In the alternate embodiment the restaurant has installed a local database and processor to interact with inquiries from the user once a

connection has been established. Thus the user may use the keyboard or voice recognition techniques to query the restaurant database as to the specials of the day and prices. The response is then forwarded by the restaurant database and local microprocessor via the telephone network and is presented to the user on the screen of the composite telephone station. The user may query multiple restaurants before making a decision or may make immediate arrangements for a reservation thereby concluding the process.

Referring to Fig. 7 the operation of this embodiment of the invention is illustrated diagrammatically in a flow chart. The user starts the process at 138 by entering his/her CDI disk at 140. The keyboard is then utilized at 142 to access a display on screen 24 of the yellow page information relating to the desired type of restaurant. An initial selection of restaurants is made from the yellow page information at 144. The user then proceeds at 146 to use the keyboard of the CDI unit to access the disk stored information on the menus of the selected restaurants. Following a narrowing of the number of restaurants under consideration the user displays the yellow page advertisement of the desired restaurant upon the screen and effects auto-dialing at 148 by depressing the auto-dial button from the buttons 28.



In the case where the restaurant has not installed its own database and microprocessor the auto-dial results in a telephone connection being established to a restaurant employee at 150. The user at 152 then ascertains from the employee the specialties of the day and at 154 the prices. The caller establishes at 156 the availability or non-availability of a reservation at the desired hour. If the caller is satisfied with the menu, prices and reservation the reservation may then be made at 158. If the caller desires additional comparative restaurant information the caller proceeds back to 144 to select another restaurant for inquiry. If the reservation is made at 158 the process is concluded at 160.

In the alternative situation where the restaurant has installed an on-site database and microprocessor the auto-dial at 148 establishes at 162 a connection to the restaurant database and microprocessor. The microprocessor interacts with keyboard entered specialty and price inquiries at 164 and 166 to obtain a display of the desired information on the screen. Alternatively the information may be orally provided by a conventional voice processing unit (VPU). The user uses the keyboard to further access the database and microprocessor at the restaurant to obtain reservation information at 168. If the reservation is desired the user may again utilize the keyboard to make the reservation at 170 and complete the

**SUBSTITUTE SHEET**

process at 160. If the user desires additional information from added restaurants the reservation is not made but the call is terminated and an additional restaurant selection is made at 144 and the intervening steps are repeated until a reservation is made. The method is thereupon concluded at 160.

While the illustrative example explained in connection with Fig. 7 has assumed at least some menu data on the user's disk it will be apparent that such information may not be available for all or even a high percentage of the involved restaurants. In such a situation the process is varied so that the menu information is obtained from the auto-dialed restaurant either through personal contact with an employee or through reliance upon a database and microprocessor at the restaurant as described as one of the alternatives of the process illustrated in Fig. 7.

While the foregoing example of a usage of the system and apparatus of the invention has dealt with restaurant reservations it will be obvious that a wide scope of other uses is possible. Thus the system may be used for making theater or other entertainment reservations or for accessing the catalogs of vending establishments to obtain information and place orders. An example of the usage of the method for the latter purpose is set forth in the Assignee's co-pending related application Serial No. \_\_\_\_\_ filed \_\_\_\_\_

**SUBSTITUTE SHEET**

Reference No. 680-038. Other usages will be apparent to those skilled in the art.

5 It will be apparent from the foregoing that there is provided according to the invention unique fully portable and mobile telephone stations capable of accepting user supplied data mediums preferably in the form of CDI disks which are capable of storing a virtually infinite variety of data or information for interacting with the new consumer telephone station. The telephone station is provided with a display screen and control switches. Interaction is provided between the database in the user disk and distributed databases in the telecommunications network. The system provides sophisticated services based upon the massive data storage capacity of a CDI disk used in conjunction with a microprocessor and memory in the telephone station as combined with the virtually limitless distributed storage data and capabilities of the telephone network and stations connected thereto.

15 20 It will be readily seen by one of ordinary skill in the art that the present invention fulfills all of the objects set forth above. After reading the foregoing specification, one of ordinary skill will be able to effect various changes, substitutions of equivalents and various other aspects of the invention as broadly disclosed herein. It is therefore intended that the protection granted hereon be limited only by the

definition contained in the appended claims and equivalents thereof.

**SUBSTITUTE SHEET**

Claims

1. In a telephone network the combination comprising:

self-powered portable telephone means including transceiver means and having a storage medium drive for accepting a storage medium selected by a user and driving said storage medium;

display means associated with said telephone means;

microprocessor means in said telephone means for driving said display means responsive at least partially to program data on said user selected storage medium; and

means in said portable telephone means for actuating said transceiver means for accessing said telephone network and databases connected thereto to provide on said display means a display of data controlled at least partially by data from at least one database other than the data stored in said storage medium.

2. A portable telephone means according to Claim 1 wherein said databases connected to said telephone network are interrelated to and interactive with data stored in said storage medium to effect a transaction in relation thereto.

3. A portable telephone means according to Claim 1 wherein said microprocessor means interacts with data from said database other than the data stored in said storage medium to present on said display means data related to data selected by the user from data on said storage medium.

4. A portable telephone means according to Claim 1 including video and audio processing means for processing data stored on said user selected storage medium.

5. A portable telephone means according to Claim 1 wherein said storage medium is a CDI disk.

6. In a switched telephone network including switching means and multiple telephone stations connected to said switching means the combination comprising:

a self-powered portable telephone station including radio transceiver means and having a storage medium drive for accepting a selectable storage medium and driving said selected storage medium;

display means associated with said portable telephone station;

microprocessor means in said portable telephone station for driving said display means responsive at least partially to program data on said selected storage medium;

15 means in said portable telephone station for  
accessing said switched telephone network and databases  
connected thereto to provide on said display means a  
display of data controlled at least partially by data  
stored in said storage medium.

7. A portable telephone station according to Claim  
6 wherein said databases connected to said telephone  
network are interrelated to and interactive with data  
stored in said storage medium.

8. A portable telephone station according to Claim  
7 wherein said microprocessor means interacts with data  
from a database other than the data stored in said  
storage medium to present on said display means data  
5 related to data selected by the user from data on said  
storage medium.

9. A portable telephone station according to Claim  
6 wherein said storage medium is a CDI disk.

10. In a telephone network the combination  
comprising:

a self-powered portable telephone station having a  
storage medium drive for accepting a storage medium  
5 inserted by a user and driving said storage medium;

display means associated with said portable telephone station; and

microprocessor means in said portable telephone station responsive at least partially to program data on said user's storage medium for driving video processor means to cause display means to display data from said data stored in said user's storage medium responsive to selections made by said user.

11. A portable telephone station according to Claim 10 including means in said portable telephone station for accessing said telephone network in response to data displayed on said display means at least partially from data stored in said storage medium.

12. A portable telephone station according to Claim 11 including means in said telephone station for accessing said telephone network and databases connected thereto to provide on said display means a display of data controlled at least partially by data from at least one database other than the data stored in said storage medium.

13. A portable telephone station according to Claim 10 wherein said portable telephone station includes port means for enabling connection to a printer or other peripheral device.



14. A portable telephone station according to Claim 11 wherein said storage medium is a CDI disk and including means in said portable telephone station for accessing said telephone network in response to data displayed on said display means at least partially from data stored in said CDI disk.

15. A method for accessing a public telephone network (PTN) using a self-powered portable telephone station (SPPTS) including transceiver means comprising the steps of:

inserting a storage medium in said SPPTS;  
actuating drive and reader means for said storage medium in said SPPTS;

selecting data on said storage medium and actuating a display thereof on said SPPTS;

actuating first control means associated with said SPPTS to select a displayed item; and

actuating second control means associated with said SPPTS to access data stored in said PTN via said transceiver means.

16. A method according to Claim 15 including the step of actuating third control means associated with said SPPTS to close a transaction responsive to said accessing of data stored in said PTN.

17. A method according to Claim 15 wherein said storage medium is a CDI disk.

18. A method according to Claim 15 including the step of connecting through said PTN to a telephone station connected to said PTN.

19. A method according to Claim 17 wherein said data selected from data on said storage medium is directory data.

20. A method for accessing a public telephone network (PTN) using a self-powered portable telephone station (SPPTS) including transceiver means comprising the steps of:

5        inserting a storage medium in said SPPTS;  
      actuating drive and reader means for said storage medium;

      selecting data on said storage medium and actuating a display thereof;

10        actuating first control means associated with said SPPTS to select a displayed item;

      actuating second control means to effect connection to said PTN via said transceiver means;

15. actuating third control means associated with said SPPTS to access data stored in said PTN relating to said displayed item.

21. A method according to Claim 20 including the step of actuating further control means associated with said SPPTS to conclude a transaction relating to said displayed item.

22. A method for accessing a public telephone network (PTN) comprising the steps of:

5. inserting a CD disk in a self-powered portable station (SPPTS), said disk having stored thereon data selected by the SPPTS user;

actuating drive and reader means for said disk;

selecting a category of data on said disk and actuating a display thereof on said SPPTS;

10. actuating first control means associated with said SPPTS to select a displayed data item;

actuating second control means associated with said SPPTS to effect connection to said PTN via said transceiver means; and

15. actuating third control means associated with said SPPTS to access data storage connected to said PTN.

23. A method for accessing a public telephone network (PTN) comprising the steps of:

inserting a CD disk in a self-powered portable telephone station (SPPTS), said disk having stored thereon data selected by the SPPTS user;

actuating drive and reader means for said disk;

selecting a category of data on said disk and actuating a display thereof on said SPPTS;

actuating first control means to select a displayed data item;

actuating second control means to effect connection to said PTN; and

actuating third control means to access data stored in and to exchange data with storage means connected to said PTN.

24. In a switched telephone network including switching means and multiple telephone stations connected to said switching means the combination comprising:

a self-powered portable telephone station including radio transceiver means and having a storage medium drive for accepting a selectable storage medium and driving said selected storage medium;

display means associated with said portable telephone station;

microprocessor means in said portable telephone station for driving said display means responsive at least partially to program data on said selected storage medium;

15

RAM storage means in said portable telephone station for storing data received by said transceiver means; and means in said portable telephone station for accessing data stored in said RAM storage means to provide on said display means a display controlled at least partially by data stored in said RAM storage means.

25. A portable telephone station according to Claim 24 wherein said data stored in said RAM storage means is interrelated to and interactive with data stored in said storage medium.

26. A portable telephone station according to Claim 25 wherein said interrelated data comprises at least partially map data.

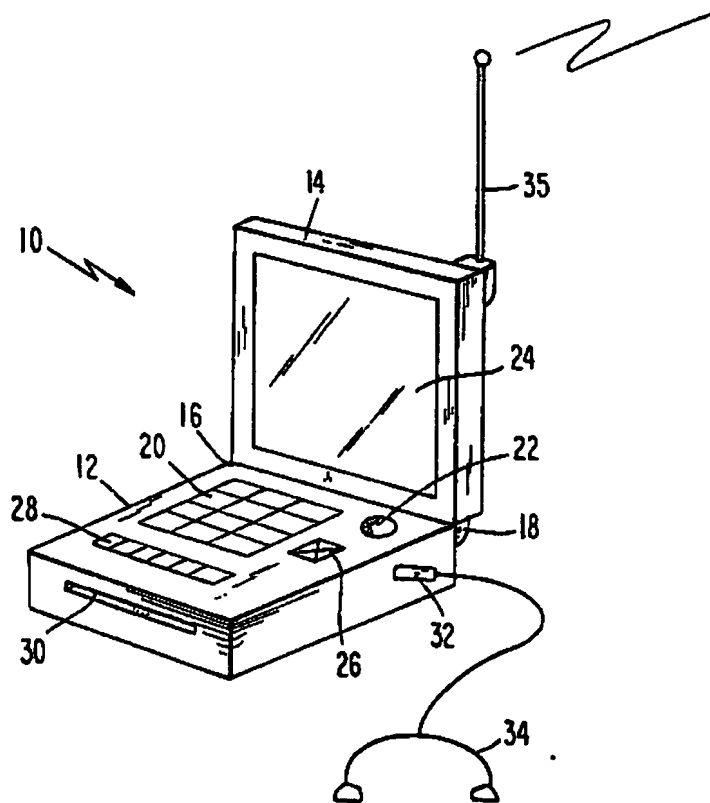


FIG. 1

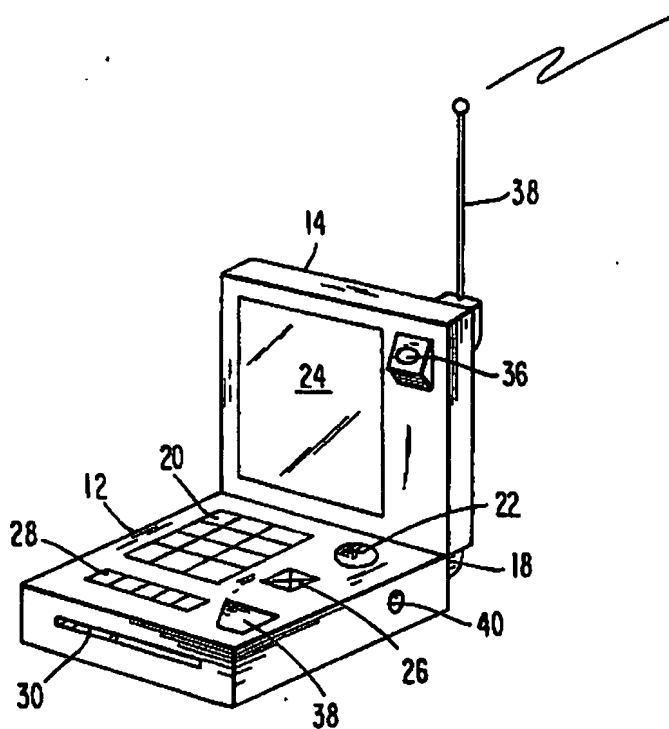


FIG. 2

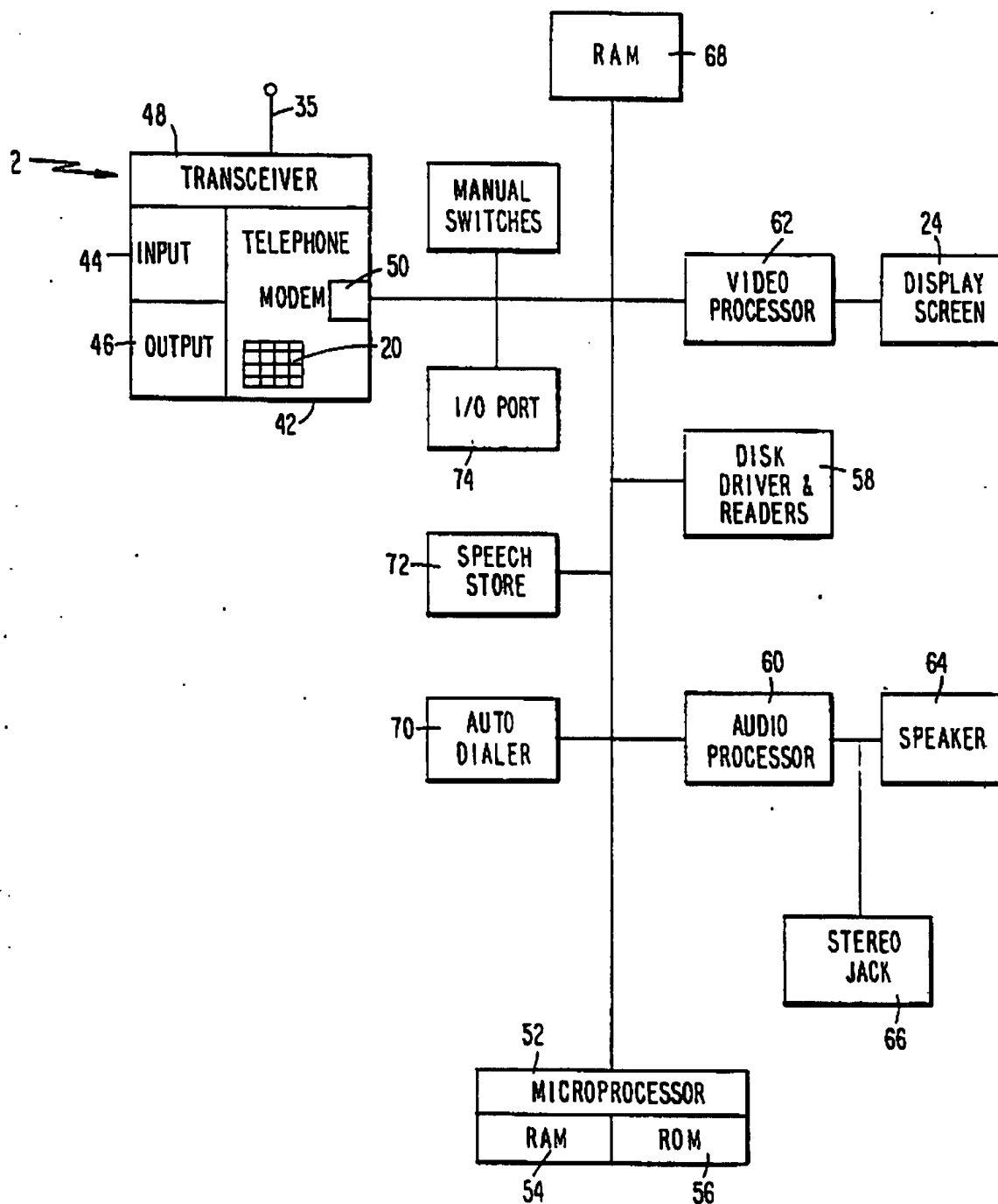


FIG. 3

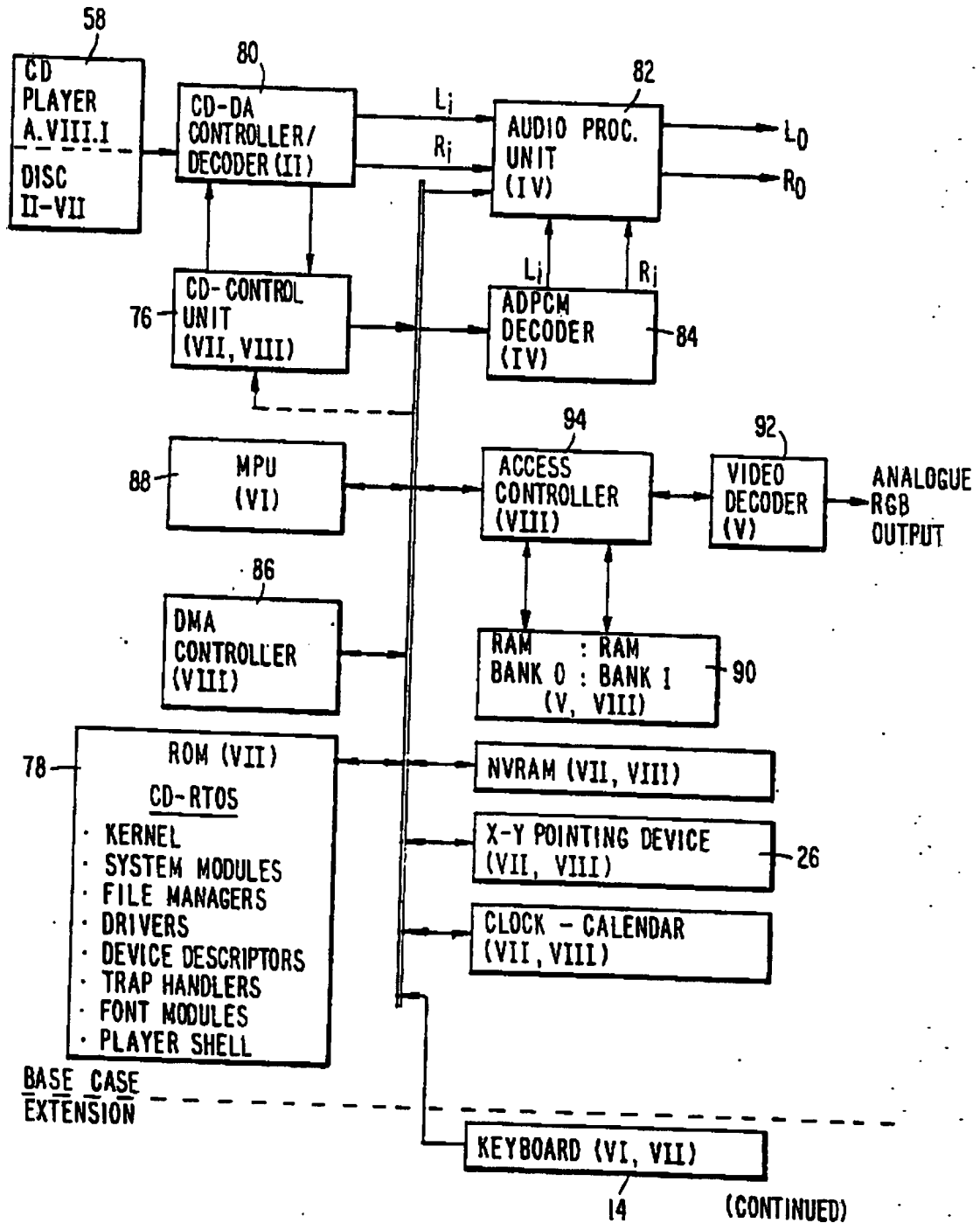


FIG. 4



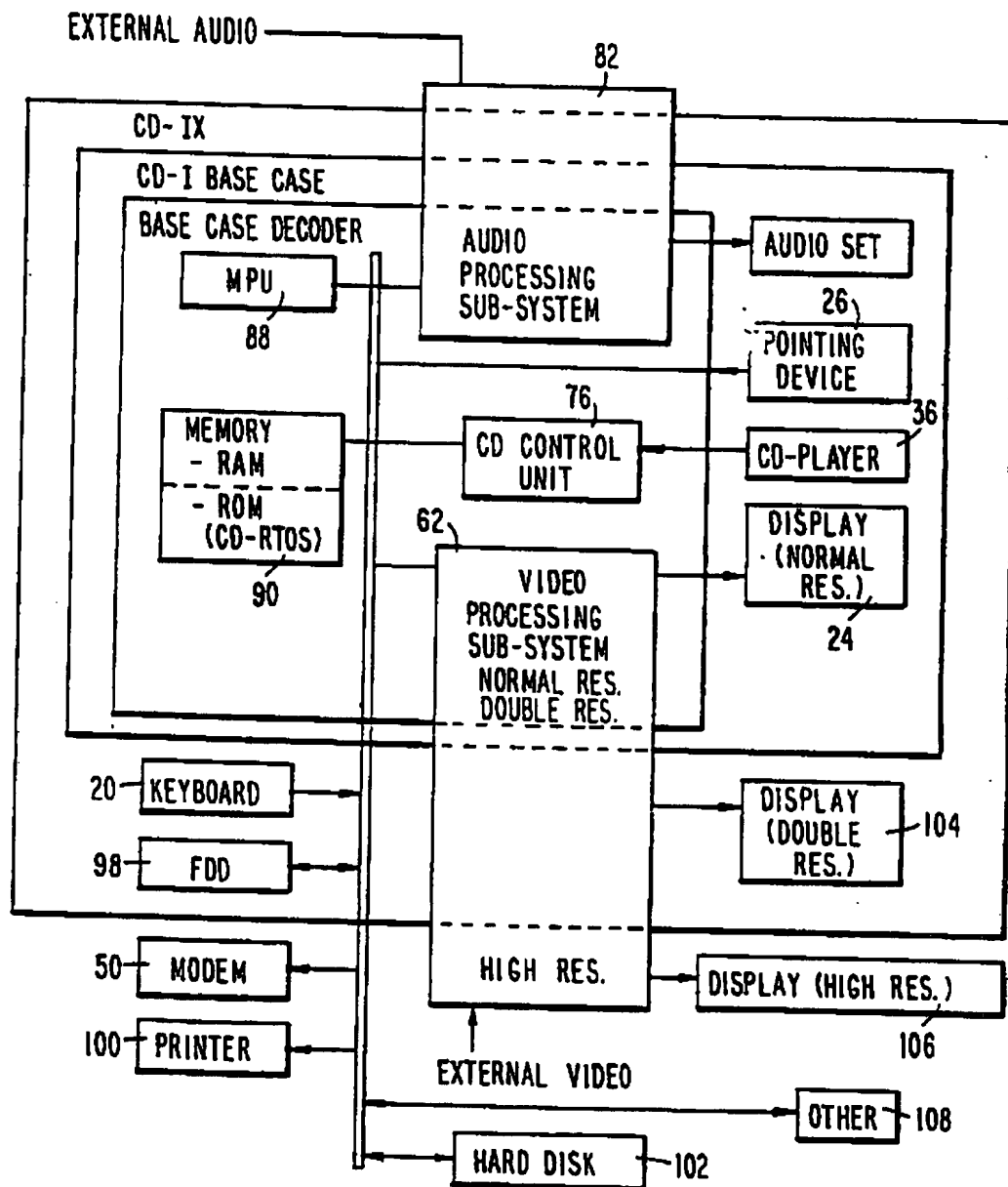


FIG. 5

SUBSTITUTE SHEET

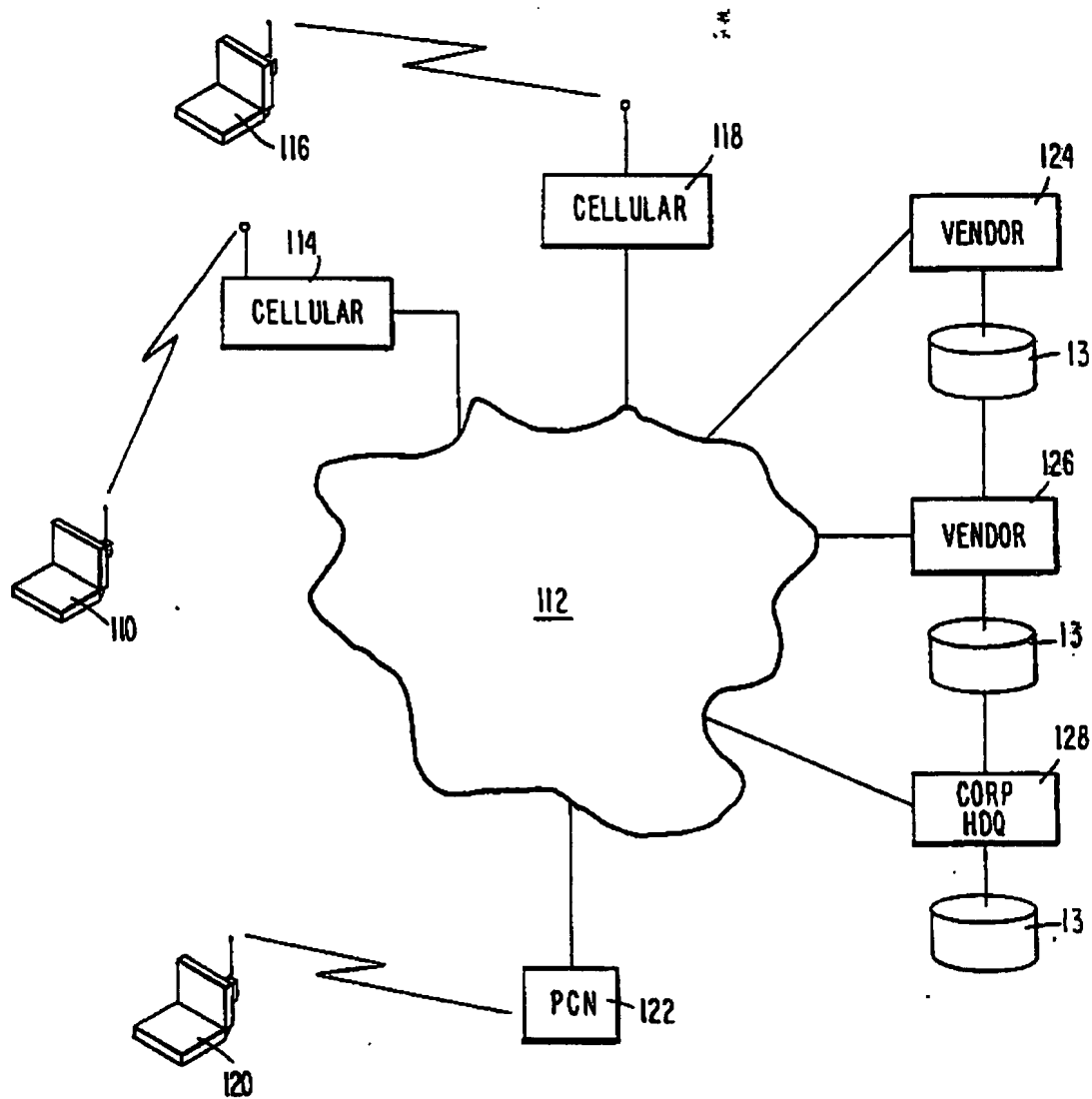
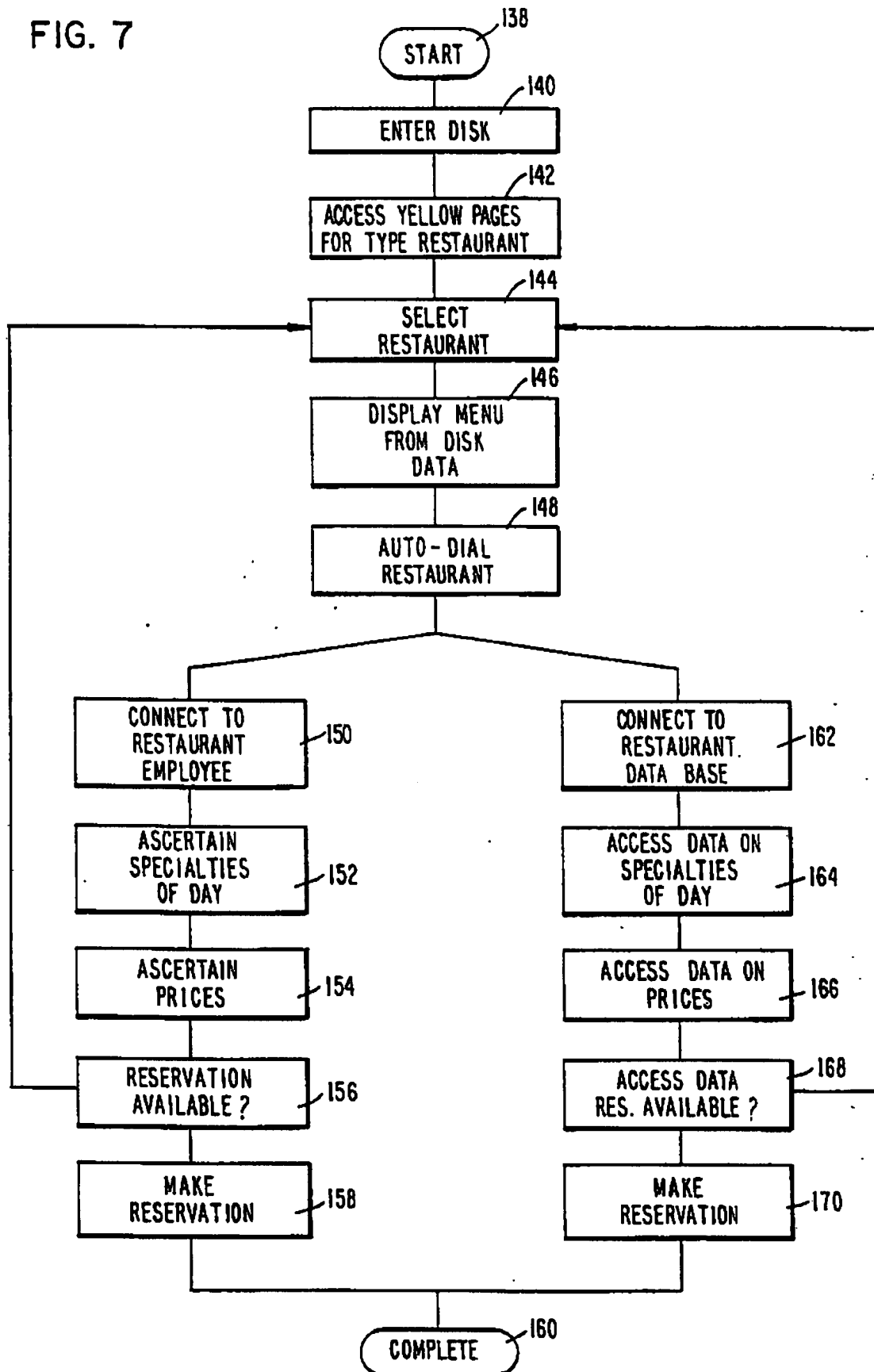


FIG. 6

6/6

FIG. 7



SUBSTITUTE SHEET

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US93/00853

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(S) : H04M 11/00

US CL : 379/58

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 379/93,110,354,357; D14/105-107,109,130,137,138,140,144,240; 455/90

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

APS &amp; INSPEC CD-ROM DATABASE

TERMS: CD, CDI, CD ROM, COMPACT DISK/M TELEPHONE, PORTABLE, (RADIO OR CORDLESS OR CELLULAR OR MOBILE)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
<u>X</u> Y	US, A, 4,991,197 (MORRIS) 05 February 1991, See figures 1-4; column 1, line 50 to column 2, line 48; column 4, line 1-8; column 9, lines 13-27.	1-3,6-8,10-13,15-16,18, <u>20,21,24,25</u> 4,5,9,14,17, 19,22,23,26
Y	US, A, 4,855,725 (FERNANDEZ) 08 August 1989, See abstract, figures 1 and 3.	4,5,9,14,17, 19,22,23,26
Y,P	US, A, D326,446 (WONG) 26 May 1992, See claim and figure 1.	4,5,9,14,17, 19,22,23,26

☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

*A	Special categories of cited documents: document defining the general state of the art which is not considered to be part of particular relevance	*T	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
*E	earlier document published on or after the international filing date	*X	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
*I	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*Y	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
*O	document referring to an oral disclosure, use, exhibition or other means	*Z	document member of the same patent family
*P	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search

11 MARCH 1993

Date of mailing of the international search report

25 MAY 1993

Name and mailing address of the ISA/US  
Commissioner of Patents and Trademarks  
Box PCT  
Washington, D.C. 20231

Facsimile No. NOT APPLICABLE

Authorized officer *my name*  
*for* DWAYNE BOST

Telephone No. (703) 305-4778

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US93/00853

## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	IEEE, June 1989, (UENO ET AL.), "Development of a Mobile Mapping System for Use in Emergency Gas Line Maintenance Vehicles", pages 177-184, See abstract, figures 7,9,10,12,13.	4,5,9,14,17, 19,22,23,26
A,P	US, A, 5,128,981 (TSUKAMOTO ET AL.) 07 July 1992, See figure 1,13; abstract.	1,6,10,24
A	US, A, 5,020,090 (MORRIS) 28 May 1991, See figure 1,2,8; column 1, lines 22-36.	1,6,10,15, 20,23,24